MAZEN™
ANIMAL HEALTH

Revolutionizing animal disease prevention is our mission

Mazen Animal Health, Inc. is a biotechnology company transforming corn seed into the future of animal vaccines. We have produced proof of efficacy data in two vaccine candidates, each addressing a significant unmet need. By creating vaccines to be delivered orally with animal feed, Mazen provides elegant solutions to the challenges associated with injectable vaccines with**: (1) increased production system ROI - improving the economic & labor thresholds that control the vaccination decision today; (2) a safer method of vaccine administration for both animals and workers; (3) optimized vaccine efficacy allowing for reduced antibiotic use; and (4) vaccines with a global reach because of ambient temperature stability and ease of delivery**.

Mazen's platform technology expresses antigens in corn seed and improves the standard vaccine manufacturing cost structure. These safe subunit antigen vaccines protect the animal by creating both mucosal and systemic immunity which should increase efficacy compared with current injectable vaccines. Corn seed containing antigen is ground into meal and added to animal feed. Cost effective disease prevention benefits the environment with decreased losses and increased productivity of protein to feed our planet.

Mazen's experienced team has delivered on the angel round milestones: expression and production of four vaccine candidates, proof of efficacy in animals, positive meeting with regulatory authorities - reaching agreement on the product development plan, and favorable feedback from our customers in market research.

Mazen has an exclusive license to over 15 issued and pending patents covering the core technology. In addition, Mazen has a pending patent on Porcine Epidemic Diarrhea Virus, (PEDV). Our strong core team encompasses R&D, regulatory, manufacturing and commercialization with specific plans to grow the team at close of the Series A financing.

Mazen closed a Series Seed round of $2M in December, 2020 for further development of PEDV vaccine candidate including completion of a sow dose ranging study, advancing regulatory and manufacturing. Mazen will raise a $7-9M Series A in 2H-2021 to continue development of the product candidates to registration and initiate development of additional product candidates. The Series A will enable Mazen to focus their initial market entry on oral swine vaccines.

Market Opportunity:

The global animal vaccine market is ~$10B with double-digit growth, using traditional vaccination. Vaccination prevents disease which in turn can result in decreased antibiotic use, desired by both regulatory authorities and consumers. Mazen's vaccines offer an opportunity to expand the existing market and increase the vaccination rates by overcoming many of the obstacles currently limiting vaccine use in animal health. Producers are seeking cost-effective ways to decrease disease and increase productivity.

Market research with veterinarians from top swine producers has further defined our product profile for the PEDV, porcine circovirus, (PCV) and rotavirus vaccines. The swine market is concentrated, making a B2B product launch strategy achievable for a small to mid-size animal health company. Internationally, we will use a key customer strategy to maximize our sales in key geographies, reducing the number of approvals needed to achieve our sales goals.

The fungal disease, Valley fever, is a regional play in the Southwest of the U.S. and Latin/South America. We plan to launch in the U.S., Latin and South America through a commercial partner.

Based upon current product development plans and the financial projections, Mazen's global revenue is projected to exceed $30M in 2025, enabling over a 10x multiple in valuation from Series A.

Product Development:

Mazen met with the USDA Center for Veterinary Biologics, the regulatory authorities overseeing vaccine registration, and reached agreement on the product development plan and the treatment of this technology as a platform technology.

With angel round funding and an NIH grant, we have produced two vaccine candidates – for PEDV and Valley fever. Two additional products are in development under SBIR grants for coccidiosis in chickens and pancreas disease in fish. We also have several on-going collaborations with animal health companies and a swine producer.

PEDV causes high mortality in young pigs, even approaching 100% in some herds, which results in significant loses in farrowing barns. In addition, endemic infections slow weight gain in older pigs, extending the time to market. While a conditional PEDV injectable vaccine is available, it has shown limited efficacy and requires labor crews to individually vaccinate each pig, therefore causing low utilization. Mazen has developed a vaccine candidate which can be dosed with feed, creating a cost-effective, safer to deliver solution for producers. In our proof of concept study, young pigs dosed with the Mazen PEDV vaccine and challenged with disease showed high titers of neutralizing antibodies in serum, indicating protection. One of the world's largest swine producers is enthusiastic about the prospect of incorporating Mazen's PEDV vaccine in its production system.

PCV and rotavirus are the next two swine vaccines to enter our development pipeline. A coccidiosis vaccine for poultry will demonstrate our ability to address multiple species.

Mazen's vaccine platform is also applicable to companion animals. The technology is well suited to address the core vaccines for both dogs and cats. Our first product concept is addressing Valley fever, a fungal infection that leads to disease not only in humans but also dogs, cats, horses, and other mammals. With 12 million dogs in the southwestern United States at risk, cases of Valley fever are increasing and can be very costly and can cause severe lung, spleen and bone infection, often leading to death. In Arizona alone, it's estimated that Valley fever costs dog owners at least $60 million per year.

There is no vaccine for Valley fever; Mazen's candidate would be a breakthrough and first of its kind anti-fungal vaccine. In lab animal testing, the Mazen vaccine elicited a biomarker response correlative with protection and reduced the burden of *Coccidioides*, the fungus that can cause Valley fever.

Leadership Team:

The Mazen team has a unique combination of breadth across biotechnology and depth in animal health. Together their mission is to create positive disruption in the animal vaccine market, delivering unmatched value for producers.

***Dr. Jenny Filbey*, CEO**, high energy entrepreneur focused on commercializing products which shift treatment paradigms; led teams and worked with biotech/pharma/animal health emerging companies to commercialize assets

***Dr. John Howard*, Board Chair**, a world leading expert in protein production in maize grain

Dr. Rick Sibbel, DVM, Strategic & Technical Lead, veterinarian involved with licensure of >20 vaccines, led major AH companies' technical service teams

Mark Zylstra, Director Regulatory Affairs, end-to-end experience in veterinary vaccine commercialization. Relevant focus area in regulatory affairs.

***Kerryann Kocher,* Commercial Advisor**, extensive expertise in swine and poultry marketing, with leadership experience at both Elanco and Bayer Animal Health.

***Dave Morrison,* Head of Finance**, in-depth public and private company experience in healthcare, SaaS software/eCommerce, professional services and logistics industries

***Board of Directors*:** Terry Coffey, PhD; Kevin Fields; Joel Harris; Jennifer Filbey, PhD; John Howard, PhD

***Advisors*:** Dick Hesse, Ph.D.; Tom Overbay, DVM

Bottom Line:

Profitable in <5 years with over 10x return.

Endless possibility for vaccinating animals worldwide, providing more plentiful and cleaner protein to the world.

Better quality of life for animals.

Contact:
Jennifer A. Filbey, Ph.D., CEO
jfilbey@mazenanimalhealth.com
256-417-8568
www.mazenanimalhealth.com